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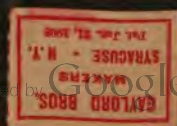
Committee on Interstate and foreign  
Commerce.

H.J.Res. 115. Andrew safety appliance.



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# HEARINGS

BEFORE THE

U.S. Congress. House.

## COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE OF THE HOUSE OF REPRESENTATIVES

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### H. J. RES. 115 ANDREW SAFETY APPLIANCE

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WEDNESDAY, AUGUST 2, 1911

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#### COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE HOUSE OF REPRESENTATIVES SIXTY-SECOND CONGRESS

WILLIAM C. ADAMSON, GEORGIA, *Chairman*

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THETUS W. SIMS, TENNESSEE  
WILLIAM B. SMITH, TEXAS  
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JOHN J. ESCH, WISCONSIN  
JOSEPH R. KNOWLAND, CALIFORNIA  
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EBEN W. MARTIN, SOUTH DAKOTA



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## ANDREW SAFETY APPLIANCE.

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,  
HOUSE OF REPRESENTATIVES,  
*Washington, D. C., Wednesday, August 2, 1911.*

The committee met at 10 o'clock a. m., Hon. William C. Adamson presiding.

The CHAIRMAN. The committee will be in order. Mr. Weeks, I would like to have a few more members present before we proceed with you. In the meantime, we will hear Mr. Andrew. Give your name and address to the stenographer, Mr. Andrew.

Mr. ANDREW. James T. Andrew, Montgomery, Ala.

### STATEMENT OF JAMES T. ANDREW, OF MONTGOMERY, ALA.

Mr. ANDREW. Mr. Chairman and gentlemen; the intent and purpose of the Andrew safety appliance is to prevent loss of life and damage to property now caused by derailments of railroad trains.

The CHAIRMAN. Mr. Andrew, I would suggest to you that as our time is going to be short to-day, if you have prepared a statement, you hand it to the stenographer, to go into the record; and then you can answer any questions that are asked.

Mr. ANDREW. All right, sir. This is my prepared statement.

The CHAIRMAN. Your statement will appear in the record, and you can answer the questions asked of you.

Mr. ANDREW. All right; that is a good suggestion and I am perfectly willing to abide by it.

Mr. J. A. MARTIN. What do you say the device is? I was not here at the former meeting.

Mr. ANDREW. The intent and purpose of this device is to prevent loss of life and damage to property now caused by derailments of railroad trains.

Judge, I can read this in about five minutes.

The CHAIRMAN. All right, if you want to do so.

Mr. ANDREW (reading):

These results are accomplished by safety wheels placed on each side of the ordinary wheels, and which have such a connection with the air-brake system that as soon as the regular wheels leave the rails the brakes are automatically applied and the train is stopped unharmed upon the rails. Should the air brakes be faulty the train would be brought to a stop, but to a more gradual stop than if the air brakes were in perfect working order, as one of the wheels of each set of wheels will act as an effectual brake on the rails independent of the air brakes.

The instant the regular wheels leave the rails the safety wheels on one side or the other contact with the track and thereby support the train while the brakes are bringing it to a stop, and they therefore prevent the train from leaving the track. In fact, they even prevent the regular wheels from reaching the crossties.

This appliance absolutely prevents all harmful results due to wrecks caused by spread tracks, broken rails, broken frogs or switches, and due to many other irregularities in the track, and now causing the numerous derailments and disasters so familiar to the public.

It also renders it impossible to have a wreck at all from loose wheels, falling brake beams and shoes, broken wheel flanges, broken journals, broken axles, broken equalizer beams, or arch bars.

As far as the truck or running gear of a train is concerned, the parts covered by this invention will absolutely prevent derailments occurring at all from the failure of any part to work; but the instant anything happens to the running gear of a train equipped with this device there is always in readiness a stronger member to take the place of a weaker member while it is running along, thereby eliminating all possibility of a derailment taking place at all.

It is perfect folly to talk about using a frail or inexpensive and inefficient device when it comes to providing one of these tremendous trains of thousands of tonnage, going at extreme velocities of over a mile a minute with ample protection. It is necessary that we put strong parts to protect weak parts. The natural elements going to make up a railroad train are very insecure, particularly as our lives are at stake and dependent upon only a flange to hold us on the rails at best. That flange is only 1 inch deep, and the least little irregularity of the tracks means that the flange naturally goes over the rails, thereby causing destruction to property, to say nothing of the immense cost of life.

Mr. J. A. MARTIN. Right there, how large are these safety wheels, as compared with the regular car wheels?

Mr. ANDREW. They are from 10 to 12 inches broad. This is 10 to 12 inches out, which gives you a track basage of 30 inches in addition to what you have now with 6 inches.

Mr. J. A. MARTIN. There would be one of these wheels outside and one immediately inside of each car wheel?

Mr. ANDREW. Yes, sir.

Mr. J. A. MARTIN. And would have a flange diameter of how many inches in width?

Mr. ANDREW. About 10 or 12 inches, according to your own mechanical ideas and according to the regulations agreed upon.

Mr. J. A. MARTIN. Even wider than the flange surface of the regular wheels?

Mr. ANDREW. Yes, sir; that is, on the face of the safety wheels. We have a train here in operation for anybody to inspect at any time they want to. In other words, you have a trackage base of 6 inches for these two regular wheels now in use, with tracks 4 feet and 8½ inches in gauge. These wheels cover a distance of 30 inches, which gives us 24 inches in excess, on each side, over the regular wheels in use now. In other words, you have 74 inches space covering a connection for only 56½ inches of gauge of railroad. [Reading:]

To perfect this invention it has taken years of the closest study and a constant application to the work in hand; therefore I have been enabled to make progress because I was constantly employed in various capacities on the different railroads of the country for the past 30 years, and my information in regard to this work is due to my practical contact with the work in hand. It is absolutely no theory with me. Everything I have accomplished has been proven out by the actual standard-gauge equipment, which has cost up to this time between \$50,000 and \$75,000.

Mr. J. A. MARTIN. In order to operate that satisfactorily, it looks as though it would be an exceedingly cumbersome equipment.

Mr. ANDREW. Not necessarily so.

Mr. J. A. MARTIN. What is the weight of the equipment?

Mr. ANDREW. A little over 2 tons to a car on the present equipment. The equipment is made of gray iron, which is the only product procurable at works in the South where we buy our material. We have to do our work with gray iron. Therefore it is now a little more cumbersome than it would be with pressed steel or equally as strong metal.

The CHAIRMAN. How much lighter will that be?

Mr. ANDREW. Two-thirds lighter than it is now, and it will be equally as strong and effective as it is now.

The CHAIRMAN. Would it be one-third lighter?

Mr. ANDREW. It would be nearly two-thirds lighter and just as strong.

Mr. J. A. MARTIN. Are these wheels elevated above the running base of the regular wheels?

Mr. ANDREW. Necessarily so, sir; about 3 inches above. Necessarily so as to avoid contacting with switches, crossovers, frogs, and guard rails, and plank at road crossings, and such things as that.

The CHAIRMAN. Have you run one of your cars, equipped as you would equip them, any great distance over any railroad?

Mr. ANDREW. We have run them from Montgomery, Ala., here, under our own steam, with the engine also equipped.

Mr. J. A. MARTIN. With a thoroughly equipped car?

Mr. ANDREW. Yes; and we have had 200 demonstrations in total. We have had 104 tests right here in Washington already. Most of the committee have seen this equipment work.

The CHAIRMAN. Do you realize any trouble in connection with the charge that your machinery is too cumbersome and too heavy?

Mr. ANDREW. I will explain that to you in regard to the tonnage or the weight of the wheels by a comparative speech. A wooden car weighs about fifty to sixty thousand pounds; a steel car will weigh from 135,000 to 160,000 pounds. Now, that is dead tonnage on those trucks. There is an excess of between 45 and 50 tons over a wooden car, yet a wooden car makes just as much money for a railroad as a steel car, therefore can not anticipate any trouble by the comparison of the facts. They have to put a great deal of money in those steel cars, they costing anywhere from \$10,000 to \$20,000 more than a wooden car.

Mr. ESCH. How much?

Mr. ANDREW. About from \$10,000 to \$20,000.

Mr. ESCH. Are you talking about a passenger coach or a freight car?

Mr. ANDREW. A passenger coach. I am not talking about a freight car at all now.

Mr. ESCH. The Pennsylvania Railroad is building an all-steel 70-foot car at its shops at Altoona for \$12,000.

Mr. ANDREW. They do not claim that in the railroad world. I have been told by railroad people that those cars usually cost between \$20,000 and \$30,000, the cars built by the Pennsylvania Railroad Co. That is what I have heard.

Mr. ESCH. I will show you the authority I have, that they cost \$12,000.

Mr. ANDREW. A passenger car?

Mr. ESCH. A passenger car; a day coach.

Mr. ANDREW. Built by their own people?

Mr. ESCH. Built in the shops at Altoona.

Mr. ANDREW. What would they build them in their shops for a foreign road?

Mr. ESCH. I do not know.

Mr. ANDREW. I have been told by people who are in the business that those cars cost anywhere from \$25,000 to \$35,000; that is, a sleeping car and some private cars, much more. I suppose an extra fine private car and cars of that kind will cost fully that much.



Mr. ESCH. I was talking of the day coach.

Mr. J. A. MARTIN. Is it not usually rail conditions that cause derailments?

Mr. ANDREW. Pretty much, I guess. We go to extremes to protect.

The CHAIRMAN. Does your contrivance always work at the right time?

Mr. ANDREW. It is automatic in everything.

The CHAIRMAN. Suppose the cars were equipped with your machinery and then in the case of a derailment it would not work?

Mr. ANDREW. It is bound to operate, because it is ready at all times to supply a part to take the place of a weaker member immediately upon the displacement of that weaker member, which is the regular posts, from rail contact.

The CHAIRMAN. It simply falls on the rail, and arrests the further fall of the car?

Mr. ANDREW. Yes, sir; and keeps the regular wheel from contact with the cross-ties—automatically applying the air.

Mr. J. A. MARTIN. It has a flange inside next to the regular wheel?

Mr. ANDREW. Yes, sir; to space it, so that the regular wheels, in bearing down, can not shear the spikes and come in contact with the fishplate.

Mr. J. A. MARTIN. These safety wheels are flanged on both sides; they are double flanged.

Mr. ANDREW. Yes, sir; so as to space the regular wheels when off of track.

Mr. SIMS. It would practically mean a double machinery on the cars.

Mr. ANDREW. No, sir; it is very simple. All you have to do is go to a wheel and buckle these two wheels on the inside. The safety wheels are cast separate usually and bolted on axle together in divisions; you buckle them around the axle and you bolt them right up to the axle. You do not have to have a turned axle or anything of that kind. You just clamp them right around the axle and set-screw them to the regular wheel.

Mr. J. A. MARTIN. They revolve?

Mr. ANDREW. They just revolve, and do not come in contact with anything when not in commission.

Mr. J. A. MARTIN. What is the lateral space between the safety wheels and the regular wheels?

Mr. ANDREW. It is about one-quarter of an inch on each side. There is no play on the axle at all. They just press there and revolve with regular wheels and axles.

Mr. RICHARDSON. You disconnect the rails, and put them 3 inches apart?

Mr. ANDREW. Yes, sir.

Mr. RICHARDSON. The space between those two rails is 6 inches, you say?

Mr. ANDREW. Six to nine inches, sometimes.

Mr. J. A. MARTIN. Can you remove the straps from a joint and draw the spikes, and throw the end of either rail 6 inches out of line, and then come at it either way, 40 or 50 or 60 miles an hour, and stay on the track?

Mr. ANDREW. Yes, sir; just throw the track all out of whack. I have spread the track 9 inches out this way [illustrating], and have

run into it with the whole thing, and have never touched the cross-ties. I ought to have brought a model here. You have a parallel gauge; the instant that gauge is broken, some part of the machinery or of the running gear of the train drops in. Now, what drops? One of those trucks drops and with it the safety wheels drop, and that wheel is locked on that track, and the regular wheel can not get back against at the rail. Without this appliance when that regular wheel is on the crosstie, bumping along, at a spread place, generally at a curve—we all know that—it means that the whole train is turned over by displacement of one miserable wheel on the spread place. A spread of  $3\frac{1}{2}$  inches will break the gauge of a railroad, but you must bear in mind that this thing will take care of it 10 or 12 inches out, here [illustrating]—just whatever distance you want under your journal box and your wheels.

Mr. J. A. MARTIN. You say it can not fail to supply the air?

Mr. ANDREW. No, sir; it can not fail to apply the air brakes.

Mr. J. A. MARTIN. An emergency application?

Mr. ANDREW. Yes, sir.

Mr. J. A. MARTIN. That would be pretty stiff.

Mr. ANDREW. Not at all; you run along on this safety appliance after the derailment. I have taken lots of people in the cars and have run up and down the roads as fast as we could run, to show that there was no jar and nothing to conflict with their safety.

Mr. J. A. MARTIN. You could almost wreck a train with the application of the air, with a train going 40 to 50 miles an hour?

Mr. ANDREW. Yes, sir; but this is gradual. It is better to have that little inconvenience or shock than to suffer loss of life, is it not?

Mr. J. A. MARTIN. Certainly.

Mr. HAMILTON. That extra weight is all down close to the track?

Mr. ANDREW. Yes.

Mr. HAMILTON. Is that an element of safety?

Mr. ANDREW. Certainly.

Mr. HAMILTON. In holding the train on the track?

Mr. ANDREW. I believe the reason that the railroads do not add more weight down next to the track is because it costs more money. It is an element of safety; there is no doubt about that.

Mr. RICHARDSON. Have you any figures showing how many people have been killed annually on the railroads in this country?

Mr. ANDREW. Yes, sir; I have them worked out exactly in detail. These figures are arrived at from the yearly total of five years, as shown by the figures of the Interstate Commerce Commission.

Mr. RICHARDSON. What effect will the use of your apparatus, as you have described it here, have upon the number of people killed by derailments?

Mr. ANDREW. It will wipe out every one of them, and prevent any of them from being harmed.

Mr. RICHARDSON. Did I not hear you say something to the effect that if the Government would make a law compelling the installation of this appliance that your company would stand the damages?

Mr. ANDREW. We could work it on that basis.

Mr. RICHARDSON. But that is no evidence—

Mr. ANDREW. In relation to that part of it, I would like very much, after we are satisfied that this is a meritorious proposition, and that there has never been an intent and purpose to work a hardship upon the railroads, and that we have intended to work from the stand-

point of a meritorious invention entirely, or one which is dependent for its success entirely upon its own merits, to impress upon you gentlemen this one fact, that for the future, and to have a permanent understanding as to how this can be applied effectually without working a hardship upon these railroad properties, I know beyond a question that it can be handled advantageously to both the railroads and the people, and it will be met with approval by the railroads as well as by the people.

Mr. RICHARDSON. In asking you that question, I did not mean to hold your company responsible, but it was to indicate your faith and confidence in the efficiency of this apparatus.

Mr. ANDREW. Quite right.

Mr. RICHARDSON. In saving lives.

Mr. ANDREW. Quite right.

The CHAIRMAN. Your immediate purpose is only to have an investigation made by the Interstate Commerce Commission, is it not?

Mr. ANDREW. I am going to leave that to you. If you will listen to this document, you will see my position in regard to that matter.

Mr. ESCH. In that last terrible wreck on the New Haven road, near Bridgeport, Conn., the cars all mounted the rails on a crossover. The New Haven road, as you know, is electrified for about 30 or 40 miles out of New York. Can you fix your appliance upon an electric motor?

Mr. ANDREW. Certainly.

Mr. ESCH. You never have tried that?

Mr. ANDREW. No, sir.

Mr. ESCH. Have you examined the mechanism of an electric motor to know whether you could use your system?

Mr. ANDREW. Yes, sir.

Mr. ESCH. Upon a motor?

Mr. ANDREW. Yes, sir. It is very simple, much easier than the other.

Mr. ESCH. You would have a fewer number of wheels?

Mr. ANDREW. A fewer number of wheels. It would be simpler, and there would be less expense attached to it.

Mr. J. A. MARTIN. How do you equip locomotives?

Mr. ANDREW. To explain that to you will use drawings.

Mr. J. A. MARTIN. The reason I asked that question is because so many derailments begin with locomotives.

Mr. ANDREW. That is right.

Mr. J. A. MARTIN. And when the locomotive derails it tears the track all up.

Mr. ANDREW. That is correct, and am glad to answer your question. There is nobody on earth who knows the insecurity of an engine running around sharp curves better than I do, as they are only protected by a flange on the little lead wheel.

Mr. J. A. MARTIN. The reason that I know is that I rode on one for four years.

Mr. ANDREW. This lead wheel is a small member with a flange to protect it. Instantly, upon this lead wheel or any part of the engine going off, the safety wheels contact with the rail, and there is a stronger member there in these safety wheels to take the place of the weaker member. It would afford substantial security to equip the engines without equipping the cars, so far as engine goes.

The CHAIRMAN. It would afford substantial security to equip the engine without equipping the cars.

Mr. ANDREW. I positively would not allow any such thing.

The CHAIRMAN. Why?

Mr. ANDREW. Because it would not be doing justice to the people who travel. It would also be an injustice upon the company. I really believe the effective way is to equip all the wheels on a train and to commercialize will be brought out a little later. It would be a great protection to the engine to have it equipped.

Mr. RICHARDSON. If you would equip the engine, it would have the same effect.

Mr. ANDREW. It would mitigate against derailments over the balance of the train, because many of the derailments are due to the derailment of the locomotive first. Now, as soon as the locomotive is derailed, the air will be applied automatically to every wheel on the train, away back for a half mile, and bring the train to a stop; but if the locomotive is unprotected by safety appliances, then, immediately upon a locomotive going off, the locomotive turns over. It is generally top-heavy, anyway.

The CHAIRMAN. Your idea is to secure legislation to compel the railroads to equip their trains with this device, or is it merely to get a recommendation as a result of the investigation as would enable you to sell it?

Mr. ANDREW. My intent and purpose is to get you gentlemen to investigate the work in hand, and then we can get together upon an amicable basis, to work for protection to the traveling public and to the railroad property. It is results I am after, not a prolonged investigation or to sell. We have a meritorious thing, which, it seems to me, should appeal to the public as well as to the railroads.

Mr. STEVENS. Are there not many other devices which, although not exactly similar, are designed to accomplish the same purpose?

Mr. ANDREW. It is so claimed by the expert board of the Interstate Commerce Commission, but I have never seen them.

Mr. STEVENS. But do not the inventors or promoters of their devices make practically the same claims for their work?

Mr. ANDREW. I am not making any claims, at all, Mr. Stevens, except this, that mine is here equipped, ready for the investigation of anybody, according to the law as I interpreted, and we are ready to proceed to put it on the railroad trains on any basis agreed upon between you gentlemen and my company. A matter I'll take up later with you gentlemen.

Mr. STEVENS. You gave very satisfactory demonstrations, but what I wanted to ask you, to make it of record, are there not many other devices which are also being pressed upon the railroads and the Interstate Commerce Commission?

Mr. ANDREW. Not upon these lines.

Mr. STEVENS. Well, upon other lines, designed to accomplish the same purpose?

Mr. ANDREW. Oh, the block signal system, for collisions and such things as that.

Mr. RICHARDSON. Have ever you known of any other company equipping or demonstrating such an appliance as this?

Mr. ANDREW. No, sir; I never have. This is an original idea entirely with me. If you gentlemen will just let me read this, you will be then able to see the gist of my remarks.

The CHAIRMAN. Let me put another question to you right now.

Mr. ANDREW. Yes, sir.

The CHAIRMAN. The Interstate Commerce Commission, in a right lengthy opinion as to your resolution, indicates that they have ample authority to investigate all these things, but not to the extent of putting them up and operating them. I want to ask you right here if you have your invention in such shape that you could aid the Commission in a thorough investigation, without putting the Government to any expense?

Mr. ANDREW. Yes, sir; and I would gladly bear all the expense myself, if necessary, to get results.

Mr. SIMS. In lines 16 and 17 of the resolution occurs the following:

In transmitting its report to Congress the commission shall recommend such legislation as to the commission seems advisable.

Do you think we ought to make a mandate on them to recommend legislation?

Mr. ANDREW. I do not think you ought to do anything at all, until you hear me through with this statement.

Mr. SIMS. What I want to know is, should Congress make a mandatory order on the commission to recommend legislation—any commission—this or any other.

Mr. ANDREW. I should judge so, after you have seen this work.

Mr. SIMS. That is not the question. Should we undertake to command the commission to recommend something to us?

Mr. ANDREW. I would prefer having a committee from this committee to investigate thoroughly into the efficiency of this device.

Mr. RICHARDSON. You understand that a thing of that kind is not binding upon anybody or anything, but should be so modified and arranged as to make it a request.

The CHAIRMAN. It may be to your interest to make this perfectly clear.

Mr. ANDREW. I want to do so, but I do not want to make a misstatement.

The CHAIRMAN. According to this resolution, the commission has no authority to go to the expense of installing your plant and running it. Are you willing to cooperate with them and help them make an investigation, without expense to the Government? If you are, you had better make it clear right now.

Mr. ANDREW. I think that when you gentlemen hear my statement, which is right here, it will answer every question you have put to me.

The CHAIRMAN. What I want to know is, the Interstate Commerce Commission says—

Mr. ANDREW. I am going to answer the Interstate Commerce Commission right now.

Mr. RICHARDSON. You want to read your statement?

Mr. ANDREW. Yes.

Mr. RICHARDSON. Go on and read it.

Mr. ANDREW. Now, we have gotten down to that point where I said it cost me from \$50,000 to \$75,000—

Mr. DRISCOLL. How much?

Mr. ANDREW. From \$50,000 to \$75,000, covering all my experiments, the cost of patents, and my living expenses, while demonstrating my different appliances, the expense of my crews, buying a train and

equipment, and all such things. We know that they cost a great deal of money to do such things. Now, why did I do it? That is the thing.

It has been and is a life work with me and has advanced conservatively and seemingly slow, to some; yet such things take time to develop and are not born over night, but represent many sleepless ones. I mention this not to try and build up a sympathy, for I need none, but to let you know I am here to stay by my guns until this appliance is put on every passenger train.

In the year 1907 and 1908 I filed with the expert board, known as the block-signal and train-control board, some patents and some photographs illustrative of the first principles of this work and was furnished by these people with a copy of the law, which I construed literally to mean that I should present to them an equipment in a completed shape and to test this device to such commission entirely free of cost to the Government.

Here is that law. It states:

Hereafter the Interstate Commerce Commission shall, and is hereby authorized at its discretion to investigate, test experimentally, and report on the use and need of any appliances or systems intended to promote the safety of railway operation which may be furnished in completed shape to such commission for such investigation and test entirely free of cost to the Government. For this purpose, the commission is authorized to employ persons familiar with the subject to be investigated and tested, and may also make use of its regular employees for such purpose.

The patents that I filed with this board are entirely obsolete to the patents I am now working under. The train that I have, and many of you have seen work, is equipped with more recent patents. I have them all here. The first patents were filed with the Interstate Commerce Board, together with these old photographs which you see here. I was under the impression that it was to the interest of the whole country that somebody should find a means or work out a method by which we could prevent harmful results caused by derailments. We all know that these things progress gradually. They are not born over night.

Mr. STEVENS. Is the board unwilling to hear you because of your previous experience?

Mr. ANDREW. It is a fact. Listen. It hardly seems fair that the board should judge my work upon the lines of my first efforts. Since they have examined only the drawings of my first patents, I have received eight new patents, greatly simplifying the work and bringing the cost down very perceptibly.

At no time have I ever been summoned to appear before this board and the letter which they claim was sent to me under date of November 11, 1909, was never received by me, and the first I knew of the existence of such a letter was a copy in the letter to the chairman of this committee of June 16, 1911. I think that date ought to have been July 16, 1911.

Mr. STEVENS. Right there, does that expert board refuse to examine and investigate your appliance, the same as we did?

Mr. ANDREW. They have turned me down on those old obsolete patents.

Mr. STEVENS. Just answer that question. Does that expert board refuse to examine and investigate and report on your appliance, the same as our committee did?

Mr. ANDREW. I have never had any more to do with that expert board.

Mr. STEVENS. You have never asked them?

Mr. ANDREW. I never depended upon them to look into my recent work. I knew it was absolutely useless, and therefore I came before you gentlemen.

Mr. STEVENS. Then you never asked them to examine and report on the appliance you now have?

Mr. ANDREW. I never have, though it was four years ago that I began my work with them. I thought they should know their own business.

The CHAIRMAN. How would it suit you for this committee to appoint a subcommittee to consider your resolution and to go and see if the commission will not go and see the demonstration?

Mr. ANDREW. Let us talk that over afterwards, Judge. It matters not how competent and skilled an engineer the commission may have; I do not believe it possible that anyone can sit in his office and properly judge this appliance as to its real worth. Therefore it is absolutely necessary that whoever sits in judgment on this case should inspect it in detail and in practical use. They should be instructed to look for the merits instead of being allowed to condemn this invention without a thorough investigation.

The copy of letter which was stated in the latter to the chairman of this committee to be sent to me includes the patents up to August 11, 1908. Since that time I have eight new patents, as follows: Nos. 897864, granted me September 8, 1908; 898165, granted September 8, 1908; 941222, granted November 23, 1909; 956261, granted April 26, 1910; 965679, granted July 26, 1910; 985650, granted February 28, 1911; 986261, granted March 7, 1911; 987094, granted March 14, 1911; which completes the patents under which I am now working.

Mr. KNOWLAND. At the previous time, you had an exhibit for them to look at.

Mr. ANDREW. Sir?

Mr. KNOWLAND. When you first filed your application with the board, did you have a train equipped?

Mr. ANDREW. I was building a car then, a picture of which you will see here. I was ready to have it investigated then, which they never did, but was told by their secretary that when they were ready I would be notified.

Mr. DRISCOLL. Can you state in a few words what objection the board made to it at that time, or later?

Mr. ANDREW. As I understand, they claimed it was too expensive, that the roads would be justified in paying all claims and making all settlements of deaths and loss of property rather than equip their trains with it.

Here in Washington I have made 104 demonstrative tests with an engine and car equipped at the expense of my company without doing one penny's damage to either equipment or tracks.

This train is here in Washington now, subject to inspection by any one who cares to be interested.

Even in the obsolete working patents examined by this board they figure that the total cost of a hundred and sixty million dollars to equip all passenger and freight cars would make it unreasonably

expensive to the railroads, and they state that it would be far less expensive for them to suffer the damage than to make such an unusual expenditure.

Although the damage is very heavy, as stated in their reports, the commission seems to think the railroads could better afford the loss and damages rather than equip their trains with a device which will prevent such loss and damage. It must be remembered, however, that when a car or an engine is equipped with this device it is a permanent fixture, and as it does not have any friction whatever and is only brought into use in time of accident, the life of said equipment would be much longer than that of any car or engine, and when a car or locomotive wears out this equipment can be transferred to another.

The CHAIRMAN. You may file your statement here.

Mr. ANDREW. All right, sir. Anything that is satisfactory to you gentlemen is satisfactory to me.

The CHAIRMAN. There was a misunderstanding between you and the commission, and if agreeable to the committee, I believe the proper thing to do, in justice to you and the commission, is to have a subcommittee take charge of this matter and consider it and see what is the matter with the commission and why it has not felt like making this investigation after our passing on the matter.

Mr. ANDREW. All right, sir.

The CHAIRMAN. If there is no objection to that course, I will ask Mr. Richardson and Mr. Stevens to take the matter under advisement.

Mr. STEVENS. I do not wish to interfere, but I think the experience of Mr. J. A. Martin in these matters—

The CHAIRMAN. I will just add Mr. Martin to the committee.

Mr. STEVENS. All right.

Mr. J. A. MARTIN. My attention was diverted while you were reading your statement.

Mr. ANDREW. Yes, sir.

Mr. J. A. MARTIN. Do I understand you to say that you could equip the pony trucks, as we call them, and the tank trucks?

Mr. ANDREW. Yes, sir; anything on the road.

Mr. J. A. MARTIN. And the driver?

Mr. ANDREW. Yes; the driver. I will show you how that is done and I am satisfied you will catch on to it in a second.

The CHAIRMAN. Evidently, we will have to answer that roll call.

Mr. ANDREW. Before doing so, I file now the balance of my statement, together with reports to show the losses from all the railroads for the fiscal years 1906 to 1910, which I wish to file as a part of my statement:

It is set forth in the board's report that it would cost \$160,000,000 to equip the 2,000,000 freight cars and the 50,000 passenger cars with this apparatus. It is further stated that in 30 years a loss of \$5,500,000 per annum from derailments would amount to about that sum.

It must be remembered, however, that after 30 years the equipment is still as good as new and in my opinion will last for an indefinite period of time, as no part is ever brought in use or subject to wear and tear except in case of accidents, and therefore would save \$160,000,000 every 30 years, according to their own report, and that the \$5,500,000 loss per annum set forth in the report of the board only includes property loss to these corporations, and does not include the amount expended in damage claims for the killing and maiming of passengers and employees—a sum that must be stupendous, but which can not be accurately ascertained because of so many private settlements.



This, however, may be estimated, as, for instance, from the years 1906 to 1910, both inclusive, the following table shows the number of people killed and injured from derailments:

*All classes of reported derailments, 1906-1910.*

[All reported derailments from known and unknown causes.]

Fiscal years.	Number derail- ments.	Killed.	Injured.
1906.....	6,261	373	4,772
1907.....	7,432	515	6,685
1908.....	6,671	314	5,122
1909.....	5,286	261	4,141
1910.....	5,918	340	4,814
Grand total 5 years, all reported derailments.....	31,541	1,803	25,544
Yearly average for 5 years.....	6,308	361	5,109

Estimating, then, the damage claims for loss of life at \$3,000 each and injuries to the person not resulting in death at \$1,000 each, we find that the railroads are subjected annually, taking the yearly average based upon these figures, to the sum of \$4,200,000 in round numbers. This does not include \$1,000,000 per month, or \$12,000,000 per year, which the figures show will average the amount of claims adjusted for freight destroyed or damaged in wrecks caused by derailments.

The average loss from injury to persons, including death, per annum is approximately \$4,200,000; for loss and damage to freight, \$12,000,000; and in destruction and injuries to cars and tracks, approximately \$5,000,000 per year, totalling approximately \$21,000,000 per year.

We are not insisting that the railroads should all at once be subjected to the expense necessary for this safety equipment, but we do insist as stated above that some fair and gradual method of equipment can be found, as, for instance, it might be required in the first place that all through lines of railroad should first equip their fast passenger trains with this device and to give to the railroads and the public the reasonable opportunity to thus test the efficiency of the appliance and then by later law gradually require with due regard to the financial conditions of the roads, to complete equipment of all passenger trains, and ultimately, of freight cars.

The Andrew Safety Appliance Co. has at its own expense bought and equipped an engine and car and demonstrated over 200 times its inventions and are still willing to make further demonstrations of its work at its own expense whenever required by the Government or any committee of Congress in charge of such a measure.

I call your attention to the safety-appliance acts approved May 2, 1893, as amended April 1, 1896, providing for the driving wheel and train brakes, automatic couplers, grab irons, and handholds, and standard height for drawbars of freight cars. Also to the act of March 2, 1903, amending the foregoing acts compelling interstate carriers to equip their cars with automatic couplers and continuous brakes, etc. Also act approved April 14, 1910, entitled "An act to supplement an act to promote the safety of employees and travelers," etc., requiring all cars to be equipped with secure sill steps and efficient hand brakes, and all cars requiring secure ladders and secure running boards to be equipped with such ladders and running boards.

Also call attention to act of May 30, 1908, making it unlawful for any common carrier engaged in interstate commerce to use any locomotive not equipped with an ashpan which can be dumped or emptied and cleaned without the necessity of any employee going under such locomotive.

All of these great and useful inventions have a maintenance cost in excess of the maintenance of the Andrew safety appliance, and no one would dream of returning to the old system in any of the above cases which have already been enacted into law.

I believe the facts and figures will show that all of the appliances above referred to and required by law to be adopted would not save anything like the human life that would be saved by the adoption of this appliance if it is successful, and that it is successful has been demonstrated by many actual experiments and will be demonstrated by as many more as may be reasonably required.

*All classes of reported derailments, 1906-1910.*

[All reported derailments from known and unknown causes.]

Fiscal years.	Number.	Killed.	Injured.	Property loss only.
1906.....	6,261	873	4,772	\$5,339,431
1907.....	7,432	515	6,695	6,556,134
1908.....	6,671	314	5,122	5,548,461
1909.....	5,259	261	4,141	4,371,512
1910.....	5,918	340	4,814	5,194,679
Grand totals, 5 years, all reported derailments.....	31,561	1,863	25,544	27,010,217
Yearly average for 5 years.....	6,368	361	5,109	5,402,045

## SUMMARY OF ALL REPORTED DERAILMENTS, FIVE YEARS, 1906-1910.

The number of train derailments from all causes has been steadily increasing during the past two years, indicating clearly evidence of deterioration of equipment and roadway details, due to the general suspension of repairs and renewals on the part of railway managements.

Derailments coming under the general classification of miscellaneous causes have either lacked explanation or have been otherwise reported as of doubtful origin, but many such accidents have undoubtedly been due to faulty roadway devices or rolling-stock appliances, and the definite causes not being assigned, it has not been possible to make a complete recapitulation of the total losses and damages resulting from train derailments as a whole.

## ALL REGULARLY CLASSIFIED DERAILMENTS (EXCLUSIVE OF MISCELLANEOUS CAUSES), 1906-1910.

*Railroad money losses and damages—All reported derailments due to specifically designated causes (largely of preventable or correctable origin)—Estimated costs to railroads (exclusive of wreck investigation and wreckage, clearing charges, freight loss, damage claims, and not including claim and legal department expenses incident to derailment accidents)*

Derailment causes, five fiscal years.	Railroad property loss.	Estimated damage.	Combined totals.
Equipment defects.....	\$10,995,373	\$4,444,000	\$15,439,373
Roadway defects.....	4,884,731	8,348,000	13,232,731
Combined.....	15,880,104	12,792,000	28,672,104
Negligence employees.....	1,413,342	3,053,000	4,466,342
Unforeseen obstructions.....	2,500,541	4,050,000	6,550,541
Combined.....	3,913,883	7,112,000	11,025,883
Malicious obstructions.....	668,678	1,157,000	1,820,678
Total estimated costs, 1906-1910.....	26,457,665	21,061,000	41,518,665
Yearly average derailment costs.....	4,061,583	4,212,200	8,303,783

NOTE.—It is assumed that death claims arising from regularly classified derailments may be conservatively averaged at \$3,000 each, while adjustment of injury claims following such train derailments average not less than \$1,000 awarded to each victim of derailment wrecks.

## SUMMARY OF ALL CLASSIFIED DERAILMENTS, FIVE YEARS, 1906-1910 (EXCLUSIVE OF MISCELLANEOUS CAUSES).

The foregoing statement of loss and damage adjustments incurred by the railroads during this five-year period, resulting from all reported train derailments of determined origin, represent less than half the disbursements made necessary through inadequacy of transportation service standards which will permit the continued and unremitting recurrence of train accidents of this description.

In addition to the \$41,518,655, chargeable to the railroads to cover five years' losses occasioned by train derailments, this same class of railroad accidents is responsible for a further expenditure of approximately a million dollars per month applied to the adjustment of claims for freight destroyed or damaged in wrecks of this nature, to say nothing of the augmented expenses of railway claim and legal departments, inseparable with complicated litigation incident to all serious derailments of preventable origin.

There is every reason to believe that it is possible for the railroads to substantially reduce the extraordinary money losses from derailment causes, which have averaged \$20,000,000 annually and totaled \$100,000,000 for the five-year period, 1906-1910, thereby stopping useless waste of funds withdrawn from operating income, and consequently providing a means of continuing much-needed betterments and profitable extensions.

*All reported derailments due to specifically designated causes (largely of preventable correctible origin).*

Fiscal years 1906-1910.	Number.	Killed.	Injured.	Property loss only.
Percentage due to equipment and roadway defects, per cent.....	83.3	37	65.2	77.62
Derailment totals, 5 years, due to combined equipment and roadway defects.....	20,228	415	11,547	\$15,880,104
Derailment totals, 5 years, reported as due to all other specifically designated causes.....	4,056	704	6,157	4,577,561
Percentage due to all other specifically designated causes.....per cent..	16.7	63	34.8	22.38
Classified derailment totals, 5 years, reported as due to all specifically designated (correctible) causes.....	24,284	1,119	17,704	\$20,457,665
Percentage of all reported derailments for 5 years, per cent.....	76.9	62.1	69.3	75.5
Yearly average derailments due to specifically designated (correctible) causes.....	4,857	224	3,541	\$4,091,533

NOTE.—The above totals are derived from yearly totals shown in Interstate Commerce Commission Accident Bulletin No. 36, page 19, Table C, for the fiscal year ending June 30, 1910.

## SUMMARY OF ALL REPORTED DERAILMENTS DUE TO SPECIFICALLY DESIGNATED CAUSES (LARGELY OF PREVENTABLE OR CORRECTIBLE ORIGIN).

The totals on the preceding page summarize a deplorable record of derailments due to five leading sources, largely correctible if not positively preventable causes, all admittedly traceable to inadequacy or failure of rolling-stock appliances, roadway defects, negligence of railway employees, unforeseen and maliciously placed obstructions.

During a period of five years these specifically designated causes of danger have been responsible for 405 train derailments, month after month, resulting in 19 fatalities; 295 serious personal injuries, and \$340,961 damage to railroad property every 30 days, necessitating a monthly deduction of \$1,666,666 from operating income, or a loss of \$84 for every mile of railway yearly, through definitely classified derailment causes.

Many if not the majority of the derailments ascribed to miscellaneous causes are beyond a doubt due to one or another of the five principal sources of train accidents of this class, probably in nearly the same relative proportion as the admitted explanations of derailments shown on the foregoing pages.

(Whereupon at 11.30 a. m. the committee took a recess until Friday, August 4, 1911, at 10 o'clock a. m.)



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